Missouri Department of Natural Resources

PUBLIC NOTICE

DRAFT MISSOURI STATE OPERATING PERMIT

DATE: May 19, 2006

In accordance with the state Clean Water Law, Chapter 644, RSMo, Clean Water Commission regulation 10 CSR 20-6.010, and the federal Clean Water Act, the applicants listed herein have applied for authorization to either discharge to waters of the state or to operate a no-discharge wastewater treatment facility. The proposed permits for these operations are consistent with applicable water quality standards, effluent standards and/or treatment requirements or suitable timetables to meet these requirements
(see 10 CSR 20-7.015 and 7.031). All permits will be issued for a period of five years, unless noted otherwise in the Public Notice for that discharge.

On the basis of preliminary staff review and the application of applicable standards and regulations, the Missouri Department of Natural Resources (MDNR), as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions. The proposed determinations are tentative pending public comment.

Persons wishing to comment on the proposed permit conditions are invited to submit them in writing to the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102, ATTN: NPDES Permits and Engineering Section / Permit Comments. **Please include the permit number in all comment letters.**

Comments should be confined to the issues relating to the proposed action and permit(s) and the effect on water quality. The MDNR may not consider as relevant comments or objections to a permit based on issues outside the authority of the Clean Water Commission, (see Curdt v. Mo. Clean Water Commission, 586 S.W.2d 58 Mo. App. 1979).

All comments must be postmarked by June 19, 2006 or received in our office by 5:00 p.m. on June 22, 2006. The requirement of a signed document makes it impossible to accept email comments for consideration at this time. Comments will be considered in the formulation of all final determinations regarding the applications. If response to this notice indicates significant public interest, a public meeting or hearing may be held after due notice for the purpose of receiving public comment on the proposed permit or determination. Public hearings and/or issuance of the permit will be conducted or processed according to 10 CSR 20-6.020.

Copies of all draft permits and other information including copies of applicable regulations are available for inspection and copying at DNR's website, http://www.dnr.mo.gov/env/wpp/index.html, or at the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday.

Public Notice Date: May 19, 2006 Permit Number: MO-0089010 Southwest Regional Office	
FACILITY NAME AND ADDRESS	**NAME AND ADDRESS OF OWNER**
Lebanon Wastewater Treatment Facility 1427 Main Lebanon, MO 65536	City of Lebanon P.O. Box 111 Lebanon, MO 65536
RECEIVING STREAM & LEGAL DESCRIPTION	**TYPE OF DISCHARGE**
Dry Auglaize Creek, Sec. 2, T34N, R16W, Laclede County	Domestic, reissuance

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0089010
Owner:	City of Lebanon
Address:	P.O. Box 111, Lebanon, MO 65536
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Lebanon Wastewater Treatment Facility
Address:	1727 Main, Lebanon, MO 65536
Legal Description:	NE ¼, Sec. 2, T34N, R16W, Laclede County
Latitude/Longitude:	+3742187/-09239091
Receiving Stream:	Dry Auglaize Creek (P)
First Classified Stream and ID:	Dry Auglaize Creek (P) (01145)
USGS Basin & Sub-watershed No.:	(10290109-060002)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 - POTW - SIC #4952
Oxidation ditch/clarifiers/sand filter/ultraviolet disinfection/sludge is land applied
Design population equivalent is 20,000.
Design flow is 2.25 million gallons per day.
Peak flow is 3.0 million gallons per day.
Design sludge production is 420 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

Effective Date

Doyle Childers, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

Expiration Date

Edward Galbraith, Director of Staff, Clean Water Commission

Instream Monitoring S1
Instream Monitoring, 50 yards upstream of Outfall 001
NE ¼, Sec. 2, T34N, R16W, Laclede County
+3742092/-9239043
Dry Auglaize Creek (P) (01145)
(10290109-060002)

Instream Monitoring S2
Instream Monitoring, at County Road Crossing
NE ¼, Sec. 30, T35N, R15W, Laclede County
+3744367/-9237244
Dry Auglaize Creek (P) (01145)
(10290109-060002)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Flow	MGD	*		*	once/day	24 hr. estimate
Temperature	OC				twice/week	grab
Biochemical Oxygen Demand$_5$	mg/L		15	10	twice/week	24 hr. comp.
Total Suspended Solids	mg/L		20	15	twice/week	24 hr. comp.
pH – Units	SU	6-9**		6-9**	twice/week	grab
Fecal Coliform	CFU/100 mL	1000		400	twice/week	grab
Ammonia as N, Total	mg/L				twice/week	grab
(May 1 – October 31)		3.1		1.6		
(November 1 – April 30)		7.5		3.7		
Bis(2-ethylhexl phthalate)	µg/L	7.7		5.9	once/month	grab
Oil & Grease	mg/L	15		10	once/month	grab
Chromium (III), Total Recoverable	µg/L	*		*	once/month	grab
Chromium (VI), Total Recoverable	µg/L	*		*	once/month	grab
Copper, Total Recoverable	µg/L	20.5		10.2	once/month	grab
Zinc, Total Recoverable	µg/L	192		89.1	once/month	grab
Phenols	ug/L	*		*	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE _____. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Whole Effluent Toxicity (WET) Test	% Survival	See Special Condition # 14	twice/year 24 hr. comp.

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE _____.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I, II & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001 (continued)						
Influent Monitoring						
Biochemical Oxygen Demand$_5$	mg/L	*		*	once/month	24 hr. comp.
Total Suspended Solids	mg/L	*		*	once/month	24 hr. comp.

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE _____.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I, II & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

Instream Monitoring (Site S1)						
Ammonia as N, Total	mg/L	*		*	once/quarter ***	grab
Temperature	°C	*		*	once/quarter ***	grab
Dissolved Oxygen	mg/L	*		*	once/quarter ***	grab
pH – Units	SU	*		*	once/quarter ***	grab
Instream Monitoring(Site S2)						
Ammonia as N, Total	mg/L	*		*	once/quarter ***	grab
Temperature	°C	*		*	once/quarter ***	grab
Dissolved Oxygen	mg/L	*		*	once/quarter ***	grab
pH – Units	SU	*		*	once/quarter ***	grab

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE _____. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I, II & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

* Monitoring requirement only.
** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.
*** Sample in the months of February, May, August, and November.

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
   (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
   (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

3. Report as no-discharge when a discharge does not occur during the report period.

4. Changes in Discharges of Toxic Substances

   The permittee shall notify the Director as soon as it knows or has reason to believe:
   (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
      (1) One hundred micrograms per liter (100 µg/L);
      (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
      (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
      (4) The level established in Part A of the permit by the Director.
   (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

5. Water Quality Standards
   (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
   (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
      (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
      (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
      (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
      (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
      (5) There shall be no significant human health hazard from incidental contact with the water;
      (6) There shall be no acute toxicity to livestock or wildlife watering;
      (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
      (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

C. SPECIAL CONDITIONS (cont.)

6. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities
   (a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.
   (b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids. Permit Standard Conditions, Part III shall apply to the land application of biosolids. Permittee shall notify the department at least 180 days prior to the planned removal of biosolids. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.

7. The department has approved the construction permit program to regulate and approve construction of sanitary sewers in the area tributary to this wastewater treatment plant or within the city limits. This approval may be revoked in whole or in part by the department if the sewage collection, transportation, or treatment facilities reach their design limitations, if the receiving facility falls into chronic noncompliance with the permit, or if the city fails to follow the terms and conditions of the approved program.

   When any of the above mentioned conditions are not met, the permittee will be notified and the construction permit authorization shall be terminated. The termination may be for an area experiencing problems, or for the entire construction permit approval.

8. As required in 40 CFR 122.21 (j)(4) the permittee shall, as part of its renewal application for this permit, submit to the department a written technical evaluation of the need to revise local limits under 40 CFR 403.5 (c)(1).

9. Bypass to the chlorine contact facility is permitted only for flows exceeding the design treatment capacity of the ultraviolet disinfection system. The ultraviolet disinfection system will always be used to treat all flows below the capacity of the system.

10. The permittee shall submit a report semi-annually, due on July 28 and January 28, which addresses measures taken to locate and eliminate sources of infiltration and inflow in the city's collection system.

11. The permittee shall maintain records of all wet weather bypassing from the collection system and the sewage treatment plant. These records shall document the duration and dates of the bypassing, the magnitude of the precipitation event causing the bypassing and the route of flow of the bypass (i.e. bypassed to final clarifier or receiving stream). Incidents of bypassing with the above information shall be included in narrative form with the discharge monitoring reports.

12. Permittee shall implement and enforce its approved pretreatment program in accordance with the requirements of 40 CFR Part 403. The approved pretreatment program is hereby incorporated by reference.

13. Permittee shall submit to the Department on or before March 31st of each year a report briefly describing its pretreatment activities during the previous calendar year. At a minimum, the report shall include the following:
   (a) An updated list of the Permittee's Industrial Users, including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Permittee shall provide a brief explanation of each deletion. This list shall identify which Industrial Users are subject to categorical pretreatment Standards and specify which Standards are applicable to each Industrial User. The list shall indicate which Industrial Users are subject to local standards that are more stringent than the categorical Pretreatment Standards. The Permittee shall also list the Industrial Users that are subject only to local Requirements;
   (b) A summary of the status of Industrial User compliance over the reporting period;
   (c) A summary of compliance and enforcement activities (including inspections) conducted by the Permittee during the reporting period.

C. SPECIAL CONDITIONS (cont.)

14. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF WET TESTING FOR THIS PERMIT				
OUTFALL	A.E.C. %	FREQUENCY	SAMPLE TYPE	MONTH
001	100	twice/year	24 hr. comp	January/July

(a) Test Schedule and Follow-Up Requirements

(1) Perform a single-dilution test in the months and at the frequency specified above. If the effluent passes the test, do not repeat the test until the next test period.
Submit test results along with complete copies of the test reports as received from the laboratory within 30 calendar days of availability to the WPP, Water Quality Monitoring and Assessment Section, P.O. Box 176, Jefferson City, MO 65102.

(2) If the effluent fails the test, a multiple dilution test shall be performed within 30 calendar days, and biweekly thereafter, until one of the following conditions are met:
(a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
(b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

(3) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WPP, Water Quality Monitoring and Assessment Section, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.

(4) Additionally, the following shall apply upon failure of the third test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact WPP, Water Quality Monitoring and Assessment Section to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the Planning Section of the WPP within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.

(5) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.

(6) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.

(7) All failing test results shall be reported to WPP, Water Quality Monitoring and Assessment Section, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.

(8) When WET test sampling is required to run over one DMR period, each DMR report shall contain information generated during the reporting period.

(9) Submit a concise summary of all test results with the annual report.

(b) PASS/FAIL procedure and effluent limitations:

(1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the upstream receiving-water control sample. The appropriate statistical tests of significance will be those outlined in the most current USEPA acute toxicity manual or those specified by the MDNR.

(2) To pass a multiple-dilution test:
(a) the computed percent effluent at the edge of the zone of initial dilution, Acceptable Effluent Concentration (AEC), must be less than three-tenths (0.3) of the LC_{50} concentration for the most sensitive of the test organisms; or,
(b) all dilutions equal to or greater than the AEC must be nontoxic. Failure of one multiple-dilution test is an effluent limit violation.

C. SPECIAL CONDITIONS (cont.)

(c) Test Conditions

(1) Test Type: Acute Static non-renewal

(2) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

(3) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.

(4) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.

(5) Single-dilution tests will be run with:

(a) Effluent at the AEC concentration;

(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and

(c) reconstituted water.

(6) Multiple-dilution tests will be run with:

(a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;

(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and

(c) reconstituted water.

(7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR,the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms,

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for (Pimephales promelas):

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water: Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.	
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

Water Quality Review Sheet
Determination of Effluent Limits

Facility Information

FACILITY NAME: Lebanon WWTF

NPDES #: MO-0089010

FACILITY TYPE/DESCRIPTION: 2.25 MGD oxidation ditch/clarifiers/gravity sand filters and UV disinfection; sludge is being land applied.

EDU: Ozark/Osage Drainage

8-DIGIT HUC: 10290109

COUNTY: Laclede

LEGAL DESCRIPTION: NE, Sec. 2, T34N, R16W

LATITUDE/LONGITUDE: +3742187/-09239091

WATER QUALITY HISTORY: Frequent bypassing of the wastewater treatment facility at first upstream manhole; several recorded bypass events have lasted more than one day. Infrequent violations of effluent limitations, but sparse information on influent BOD and TSS make percent removal calculations difficult.

Outfall Characteristics

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	RECEIVING WATERBODY	OTHER
001	3.49	Advanced Secondary	Dry Auglaize Creek	

Receiving Waterbody Information

WATERBODY	CLASS	WBID	1Q10 (CFS)	7Q10 (CFS)	30Q10 (CFS)	*DESIGNATED USES
Dry Auglaize Creek	P	1145	0.1	0.1	1.0	LWW, AQL

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warm water Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

COMMENTS: Dry Auglaize Creek is on the Missouri 2002 303(d) list for unknown pollutants from the Lebanon WWTF. Reduced biodiversity downstream of the facility is most likely the result of low dissolved oxygen and reduced habitat due to increased BOD and TSS loading

caused by chronic bypassing
from the WWTF. The City of Lebanon is under a consent decree with the department and USEPA
to eliminate bypassing and ensure adequate capacity in the collection system and WWTF.

Mixing Considerations

Mixing Zone (MZ): One-quarter (1/4) of the stream volume of flow; length one-quarter (1/4) mile [10 CSR 20-7.031(4)(A)4.B.(II)(a)]. MZ volume of flow = 0.025 cfs, Dilution factor = 1.01

Zone of Initial Dilution (ZID): One-tenth (0.1) of the mixing zone volume of flow [10 CSR 20-7.031(4)(A)4.B.(II)(b)]. ZID volume of flow = 0.0025 cfs, Dilution factor = 1.00

$$A.E.C.\% = \left(\frac{DesignFlow + ZIDFlow}{DesignFlow}\right)^{-1} \times 100$$

Permit Limits and Information

TMDL Watershed: (Y or N)	W.L.A. Study Conducted: (Y or N)	Disinfection Required: (Y or N)	Use Attainability Analysis: (Y or N)
Y	N	Y	N

OUTFALL #001– Main Facility Outfall

Wet Test (Y or N): Y Frequency: Twice/Year A.E.C. 100 % Limit: 10 CSR 20-7.031(3)(I)

Parameter	Units	Daily Maximum	Weekly Average	Monthly Average	Monitoring Frequency
Flow	MGD	*		*	Once/Day
Temperature	°C	*		*	Twice/Week
Biochemical Oxygen Demand (BOD_5)***	mg/L		15	10	Twice/Week
Total Suspended Solids***	mg/L		20	15	Twice/Week
pH	SU	6 – 9		6 – 9	Twice/Week
Total Ammonia Nitrogen (May 1 – Oct 31)	mg/L	3.1		1.6	Twice/Week
Total Ammonia Nitrogen (Nov 1 – Apr 30)	mg/L	7.5		3.7	Twice/Week
Fecal Coliform	Note 1	1000		400	Twice/Week
Oil & Grease	mg/L	15		10	Once/Month
Bis (2-ethylhexyl phthalate)	µg/L	7.7		5.9	Once/Month
Chromium (III), Total Rec.	µg/L	*		*	Once/Month
Chromium (VI), Total Rec.	µg/L	*		*	Once/Month
Copper, Total Rec.	µg/L	20.5		10.2	Once/Month
Zinc, Total Rec.	µg/L	192		89.1	Once/Month
Phenols	µg/L	*		*	Once/Month

* – Monitoring Requirement Only, Note 1 – Colonies/100 mL

*** – This facility is required to meet a removal efficiency of 85% or more for BOD_5 and TSS. Influent BOD_5 and TSS data shall be reported to ensure removal efficiency requirements are met.

Receiving Water Monitoring Requirements

Site S1 – Upstream monitoring location

Parameter	Sampling Frequency	Sample Type	Location
Dissolved Oxygen	Once/Quarter	Grab	Dry Auglaize Creek upstream of facility outfall
Total Ammonia Nitrogen	Once/Quarter	Grab	
Temperature	Once/Quarter	Grab	
pH	Once/Quarter	Grab	

Site S2 – Downstream monitoring location

Parameter	Sampling Frequency	Sample Type	Location
Dissolved Oxygen	Once/Quarter	Grab	Dry Auglaize Creek one-quarter (1/4) mile downstream of facility outfall
Total Ammonia Nitrogen	Once/Quarter	Grab	
Temperature	Once/Quarter	Grab	
pH	Once/Quarter	Grab	

Derivation and Discussion of Limits

Wasteload allocations were calculated using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Outfall #001 – Main Facility Outfall

- **Biochemical Oxygen Demand (BOD_5).** 10 mg/L monthly average, 15 mg/L weekly average [10 CSR 20-7.015(4)(B)1.]

- **Total Suspended Solids (TSS).** 15 mg/L monthly average, 20 mg/L weekly average [10 CSR 20-7.015(4)(B)2.]

- **pH.** pH shall be maintained in the range from six to nine (6 – 9) standard units [10 CSR 20-7.015(4)(B)3.]

- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]; background ammonia nitrogen = 0.01 mg/L.

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Summer	28	7.8	1.3	12.1
Winter	6	7.8	3.1	12.1

Summer: March 1 – October 31, Winter: November 1 – April 30

Summer

Chronic WLA: $C_e = ((3.49 + 0.025)1.3 – (0.025 * 0.01))/3.49$

$C_e = 1.3$ mg/L

Acute WLA: $C_e = ((3.49 + 0.0025)12.1 – (0.0025 * 0.01))/3.49$

$C_e = 12.1$ mg/L

LTA_c = 1.3 mg/L (0.780) = **1.0 mg/L** [CV = 0.6, 99th Percentile, n = 30]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 1.0 mg/L * 3.11 = 3.1 mg/L [CV = 0.6, 99th Percentile]
AML = 1.0 mg/L * 1.55 = 1.6 mg/L [CV = 0.6, 95th Percentile, n = 4]

Winter

Chronic WLA: $C_e = ((3.49 + 0.025)3.1– (0.025 * 0.01))/3.49$

$C_e = 3.1$ mg/L

Acute WLA: $C_e = ((3.49 + 0.0025)12.1 – (0.0025 * 0.01))/3.49$

$C_e = 12.1$ mg/L

LTA_c = 3.1 mg/L (0.780) = **2.4 mg/L** [CV = 0.6, 99th Percentile, n = 30]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 2.4 mg/L * 3.11 = 7.5 mg/L [CV = 0.6, 99th Percentile]
AML = 2.4 mg/L * 1.55 = 3.7 mg/L [CV = 0.6, 95th Percentile, n = 4]

- **Fecal Coliform.** Discharge shall not contain more than a monthly geometric mean of 400 colonies/ 100 mL, daily maximum of 1000 colonies/100 mL [10 CSR 20-7.015(4)(B)4.] Future renewals of the facility operating permit will contain effluent limitations for E. coli which will replace fecal coliform as the applicable bacteria criteria in Missouri's water quality standards.

- **Oil & Grease**. Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

- **Bis (2-ethylhexyl phthalate)**. Human Health Protection-Fish Consumption CCC = 5.9 µg/L; background Bis (2-ethylhexyl phthalate) = 0.0 µg/L. Procedures for calculating WQBELs for this parameter obtained from Section 5.4.4. of EPA/505/2-90-001.

  WLA: C_e = ((3.49 + 0.025)5.9 – (0.025 * 0.0))/3.49

  C_e = 5.9 µg/L

  AML = WLA = 5.9 µg/L

  MDL = WLA * 1.30 = 7.7 µg/L [CV = 0.4, 95th Percentile]

- **Metals**. Effluent limitations for total recoverable chromium will be removed and replaced with monitoring only requirements as a result of the reasonable potential analysis. The monitoring only requirements will reflect the chromium species found in Table A of 10 CSR 20-7.031. Effluent limitations for total recoverable copper and zinc will be retained and recalculated using updated MZ, ZID, and outfall specific statistical multipliers.

Metal	CMC (µg/L)	CCC (µg/L)	Receiving Water Concentration Acute/Chronic (µg/L)	Reasonable Potential
Chromium	901	100 (DWS)	19.8 / 19.8	No
Copper	23	12	65.2 / 65.2	Yes
Zinc	188	172	261 / 261	Yes

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in EPA/505/2-90-001 and "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" (EPA 823-B-96-007). Protection of aquatic life criteria apply and water hardness = 180 mg/L.

Due to the absence of contemporaneous effluent and in-stream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and absorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the department, partitioning evaluations may be considered and site-specific translators developed.

Metal	Conversion Factors		WQBEL
	Acute	Chronic	
Copper	0.960	0.960	**Yes**
Zinc	0.978	0.986	**Yes**

Copper (Cu): Protection of Aquatic Life CCC = 12 µg/L, CMC = 23 µg/L [10 CSR 20-7.031, Table A]; Background Cu = 2.5 µg/L

C (Chronic) = CCC/CF = 12/0.960 = 12.5 µg/L

C (Acute) = CMC/CF = 23/0.960 = 24.0 µg/L

Chronic WLA: C_e = ((3.49 + 0.025)12.5– (0.025 * 2.5))/3.49

C_e = 12.6 µg/L

Acute WLA: C_e = ((3.49 + 0.0025)24.0 – (0.0025 * 2.5))/3.49

C_e = 24.0 µg/L

LTA_c = 12.6 µg/L (0.527) = **6.6 µg/L** [CV = 0.6, 99th Percentile]
LTA_a = 24.0 µg/L (0.321) = 7.7 µg/L [CV = 0.6, 99th Percentile]

MDL = 6.6 µg/L * 3.11 = 20.5 µg/L [CV = 0.6, 99th Percentile]
AML = 6.6 µg/L * 1.55 = 10.2 µg/L [CV = 0.6, 95th Percentile, n = 4]

Zinc (Zn): Protection of Aquatic Life CCC = 172 µg/L, CMC = 188 µg/L [10 CSR 20-7.031, Table A]; Background Zn = 2.5 µg/L

C (Chronic) = CCC/CF = 172/0.986 = 174 µg/L
C (Acute) = CMC/CF = 188/0.978 = 192 µg/L

Chronic WLA: C_e = ((3.49 + 0.025)174– (0.025 * 2.5))/3.49

C_e = 175 µg/L

Acute WLA: C_e = ((3.49 + 0.0025)192 – (0.0025 * 2.5))/3.49

C_e = 192 µg/L

LTA_c = 175 µg/L (0.481) = 84.2 µg/L [CV = 0.7, 99th Percentile]
LTA_a = 192 µg/L (0.281) = **54.0 µg/L** [CV = 0.7, 99th Percentile]

MDL = 54.0 µg/L * 3.56 = 192 µg/L [CV = 0.7, 99th Percentile]
AML = 54.0 µg/L * 1.65 = 89.1 µg/L [CV = 0.7, 95th Percentile, n = 4]

- **Phenols.** Results from the reasonable potential analysis indicate no reasonable potential for the Lebanon WWTF to cause excursions above applicable phenol water quality criteria; therefore, the effluent limitation will be removed and replaced with a monitoring only requirement.

Reviewer: John Hoke
Date: April 5, 2006

Unit Chief: Refaat Mefrakis

Monitoring and effluent limits contained within this document have been developed in accordance with EPA guidelines using the best available data and are believed to be consistent with Missouri's Water Quality Standards and Effluent Regulations. If additional water quality data or anecdotal information are available that may affect the recommended monitoring and effluent limits, please forward these data and information to the author.